DIRITTO DELL'ECONOMIA

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BEYOND MICA

An overview of developments on crypto-assets

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STAKING SERVICES: TAXONOMY, RISKS AND REGULATION

by *Salvatore Luciano Furnari*

1. *From an old idiom to the pillar of crypto-asset markets*

The idiom "*to put something at stake*" originates from medieval English and intertwines both literal and figurative history. Etymologically, *stake* began as Old English *staca*, meaning a pointed post used for fencing, supporting plants, tethering animals [1]. By the 16th century, the term evolved to signify a wagered stake—what one risks in bets or games. The phrase "*at stake*" emerged around 1600, metaphorically indicating something placed in jeopardy as if physically locked to a stake and thus vulnerable to loss [2]. Hence, to "put something at stake" historically meant placing it in peril or as a bet—blending the concrete image of tethering with the abstract risk of losing what is valued.

This linguistic trajectory is particularly instructive when transposed to contemporary financial technologies. A system such as blockchain, inherently reliant upon trust and designed as a self-sustaining ecosystem in which the enforcement of traditional legal mechanisms proves arduous, requires its participants to "put something at stake" in order to mitigate opportunistic or malicious behaviours. The idiom thus provides a semantic key to understanding the logic of *staking services*: the very "invention" of staking resides in this ancient metaphor, operationalized in the digital sphere as the voluntary immobilization of assets to guarantee honest conduct.

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[1] Source *Etymonline.com*.

[2] One theory connects this metaphor to bear-baiting events, where beasts were tied to stakes and bets placed on outcomes, though direct evidence remains limited. Source *Theidioms.com*.

At present, staking services [3] constitute one of the foundational pillars of crypto-asset markets. Although staking is not, in its technical structure, a financial service as defined by MiFID II or a crypto-asset service as defined by MiCAR, it nevertheless represents a core operational process upon which the functioning of crypto-assets markets depends. Its juridical significance therefore lies not only in the innovative design of incentive and sanction mechanisms but also in its role as an indispensable infrastructure for the governance and sustainability of decentralized ecosystems.

2. *Definition of staking services. The reward and sanction mechanism*

The function of *staking* consists precisely in the participation in the validation activity of a distributed ledger through the setting up of a node [4]. In particular, in permissionless systems [5], blockchains adopting the proof-of-stake

[3] Literature on staking is widespreading. For legal analysis of staking services, see N.E. GONZALEZ, *Does Cryptocurrency Staking Fall Under SEC Jurisdiction?*, in *Fordham Journal of Corporate & Financial Law*, 27, 2, 2022, 521 ss.; G. ANSIDERI, D. SCHETTINI, *Staking in Decentralised Finance: Functional Taxonomy and Regulation*, Working Paper, 2025; J.S. HART, *Policing Proof-of-Stake Networks: Regulatory Challenges Presented by Staking-as-a-Service Providers and the Need for a Tailored Regime*, in *Columbia Science & Technology Law Review*, 23, 2021, 192 ss; EUROPEAN PARLIAMENT, *Decentralised finance: mapping the challenges to financial regulation*, Directorate-General for Internal Policies, Policy Department for Economic, Scientific and Quality of Life Policies, Study – PE 740.083, 2023.

For the economic implication, see, above all, K. JOHN, T. RIVERA, F. SALEH, *Equilibrium Staking Levels in a Proof-of-Stake Blockchain*, SSRN Working Paper, 2021; P. HE, D. TANG, J. WANG, *Staking Pool Centralization in Proof-of-Stake Blockchain Network*, SSRN Working Paper, 2020; D. KRAUSE, *Exploring Ethereum Staking: Mechanics, Yields, and Future Prospects*, in *International Journal of Cryptocurrency Research*, 2024, 4(2), 163-174; S. CARRE, F. GABRIEL, *Liquid Staking: When Does It Help?*, SSRN Working Paper, 2024; S. SCHARNOWSKI, H. JAHANSHAHLOO, *The Economics of Liquid Staking Derivatives: Basis Determinants and Price Discovery*, SSRN Working Paper, 2024; L.W. CONG, Z. HE, K. TANG, *The Tokenomics of Staking*, SSRN Working Paper, 2022; C. ALEXANDER, *Leveraged Restaking of Leveraged Staking: What Are the Risks?*, SSRN Working Paper, 2024; M. LEHMANN, F. KRYSA, E. PRÉVOST, F. SCHINERL, R. VOGELAUER, *Staking Your Crypto: What Are the Stakes?*, in *J. Bus. & Tech. L.*, 2023, 19, ss.

[4] It is technical operation whereby a participant installs and configures the necessary software and hardware to connect to the distributed ledger network. A node functions as an active point of the network's infrastructure: it stores a copy of the ledger, verifies the validity of incoming transactions, and—if designated as a validator—participates in the consensus mechanism by proposing or confirming new blocks.

[5] F. BASSAN, M. RABITTI, *Recenti evoluzioni dei contratti sulla blockchain. Dagli smart legal contracts ai 'contracts on chain'*, in *Riv. dir. banc.*, III, 2023, 561-639.

("PoS") consensus mechanism [6] allow users, without the need for centralized authorization, to participate directly in sustaining the security and functionality of the network. This open architecture is a key feature of blockchain governance, as it democratizes participation while simultaneously embedding responsibility through the staking requirement.

According to the above, the process of *staking* may be defined as the process by which crypto-assets are immobilized (*put at stake*) within a validator node, thereby enabling participation in the validation of transactions in blockchains adopting the PoS consensus mechanism [7].

In particular, most protocols require that staked assets remain immobilized for a predefined period, commonly referred to as the "bonding period". During this interval, the withdrawal of assets from the staking mechanism entails the ineligibility of the validator to receive further rewards, thereby reinforcing the commitment to active and continuous participation.

Within this framework, the immobilization of users' crypto-assets (that are "*put at stake*") operates as an *ex ante* incentive to act honestly and in accordance with network rules. Indeed, in an ecosystem developed following the motto "code is law", validators need, on the one hand, economic incentive to act honestly and efficiently but, on the other, sanctions in order to avoid dishonest or negligent conduct. So, the essence of staking services can be understood considering the two sides of any incentive mechanism: rewards and sanctions.

From the reward side, rewards generally take two forms: (i) the allocation of newly minted tokens [8]; and (ii) a share of transaction fees paid within the

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[6] In order for a blockchain to function, there is the need that validator nodes reach consensus on the "state" of the blockchain. Such *state* comprises a dynamic set of data, including the record of addresses, balances, transactions, smart-contract codes, and other protocol-relevant information. PoS consesus mechanism is the evolution of Prof-of-Work (PoW) consensus mechanism. In Proof of Work (PoW), instead of selecting validators based on the amount of crypto-assets locked as collateral, the network relies on computational effort and energy consumption to validate transactions, making attacks costly. From this perspective, PoS is considered less environmentally burdensome than PoW.

[7] For a similar definition, please see FINMA, *Guidance 08/2023, Staking*, of December 2023, stating "*FINMA regards staking as the process of blocking native cryptoassets at the staking address of a validator node in order to participate in a blockchain validation process based on a proof-of-stake consensus mechanism. Participants earn rewards for staking cryptoassets*".

[8] The distribution of newly minted tokens constitutes the primary mechanism by which most blockchain protocols incentivise validation activity. In legal-economic terms, this practice can be regarded as a form of endogenous "issuance" or "seigniorage" within the system, whereby the protocol autonomously creates additional units of the crypto-asset and assigns them to validators. This mechanism ensures a predictable stream of remuneration independent of the current level of network activity, yet it also raises questions concerning the monetary policy of the

network [9]. From a systemic perspective, these rewards are not merely economic incentives but also economic instruments aimed at aligning individual interests with the collective interest in maintaining network integrity. The rewards (together with the probability to be chosen for validating a specific transaction) are usually in proportion with the amount of crypto-asset *staked* within a node.

But it is from the sanction side that staking took its name. Indeed, when crypto-assets are *staked* within a node, they are also exposed to a menace potential loss, in case of misconduct. The locking of crypto-assets subjects them to a regime of potential forfeiture, commonly referred to as *slashing*. This mechanism is designed to enforce honest behaviour by validators: where a node engages in misconduct—whether by validating fraudulent transactions, remaining offline for prolonged periods, or attempting to manipulate consensus—the protocol may automatically confiscate part or all of the staked assets. From an economic standpoint, slashing transforms staking into a high-stakes contractual commitment, where the validator's financial exposure guarantees the integrity of the network. From a legal perspective, this feature raises delicate issues, such as whether the forfeiture of assets should be construed as a contractual penalty, a liquidated damage clause [10], or a sui generis disciplinary measure inherent to the protocol's governance structure. From this point of view, staking embeds a self-enforcing mechanism of compliance in a setting where the recourse to traditional legal enforcement proves structurally limited.

3. *Staking taxonomy and ancillary services*

Staking services may be classified into three main categories, each characterized by a different allocation of responsibilities and control over the staked

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protocol, the inflationary impact on existing holders, and the potential qualification of such rewards as a form of consideration for services rendered under financial or tax law.

[9] The allocation of transaction fees, by contrast, represents a remuneration mechanism grounded not in new issuance but in the redistribution of value already circulating within the network. Every user submitting a transaction pays a fee, which is collected by validators as part of their compensation. This model ties the validator's reward to the actual level of network usage and therefore creates a direct economic link between protocol adoption and validator incentives. From a legal perspective, transaction-fee rewards may be more readily comparable to remuneration for the provision of infrastructural services, since no alteration of the asset's supply occurs; nevertheless, they still pose interpretative challenges with respect to their regulatory classification, particularly when combined with other incentive mechanisms such as token issuance or staking yields.

[10] Although these two possible qualifications have been mentioned, given the decentralised nature of the protocol and the absence of any entity responsible for its operation, it appears difficult to conceive of a contractual relationship between the user and the protocol.

assets. In particular, it is possible to distinguish between: (i) solo staking; (ii) delegated (non-custodial) staking; and (iii) custodial staking.

In the first category it is possible to include the activity carried out directly by the asset holder, who participates autonomously in the validation process by setting up the node by himself and staking his own crypto-assets. The *solo staking model* is conceptually the most straightforward, as it presupposes no reliance on third parties and thus no intermediation risks.

In *delegated (non-custodial) staking*, the holder participates in validation activities through the intermediation of another subject, but without transferring control of the crypto-assets to such intermediary [11]. The core element here is the granting of validation rights absent any transfer of custody, which makes this model particularly relevant from a regulatory standpoint, as it raises questions of qualification under contractual law of the relation between the asset holder and the intermediary but not necessarily under financial regulation (as will be discussed *infra*).

In particular, the offering of delegated (non-custodial) staking services finds its *ratio* on the fact that, as described above, the participation in the validation activities presupposes the establishment of a node, a process that may entail considerable technical complexity and economic cost, rendering it impractical for ordinary users. This activity, indeed, implies both a technological commitment (maintaining adequate computational resources, internet connectivity, and security measures) and an economic commitment (locking the required amount of crypto-assets as collateral, an amount that could be considerable for a non-professional user [12]). To reduce such transaction costs, third-party operators offer so-called *validator-as-a-service* solutions: they set up and maintain the node infrastructure while receiving from other users a *delegation* of staking rights without ever obtaining control of their private keys. In consideration for this activity, the third-party validator retains a service fee, while the asset holder continues to benefit from staking rewards. This contractual arrangement has become central in the dissemination of staking, as it lowers the barriers to entry and democratizes participation.

The third category is called *custodial staking*. Here, the user relies upon an intermediary, not only for the exercise of validation rights, but also for the custody of the crypto-assets. In such cases, the intermediary performs a dual role:

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[11] The U.S. Securities and Exchange Commission (SEC), in its "*Statement on Certain Protocol Staking Activities*" of 29 May 2025, has described this category as involving a "*Node Validator that is granted validation rights from crypto-asset owners*".

[12] To activate a validator node on Ethereum, a deposit of 32 ETH is required. Given the current market value of one ETH is approximately €3,500-€3,550, the total cost in euros amounts to about €112,000-€113,500.

(i) validator on behalf of the owner, and (ii) custodian of the owner's crypto-assets. The inclusion of custody services constitutes a material distinction from non-custodial delegation, as custody of digital assets is frequently subject to specific regulatory frameworks. Under MiCAR, for instance, the provision of custody services will trigger licensing obligations and investor protection requirements.

While solo staking is relatively unambiguous, both delegated and custodial staking share the common feature of intermediation. It therefore becomes crucial, from a legal-regulatory perspective, to identify precisely which services the intermediary provides. Indeed, this distinction determines whether the activity falls within the scope of regulated services under applicable legislation (such as MiCA) or whether it may be considered a non-regulated activity (see *infra*).

Beyond these categories, certain activities often marketed within the DeFi environment should not be confused with proper staking services. These include arrangements that allow holders to earn additional tokens by locking existing ones, yet without any link to validation of network transactions. Given the absence of a validation function, it is conceptually accurate to label such practices as *staking-in-name-only* ("SINO"). As SINO activities lack the essential characteristic of contributing to consensus and network security.

Beyond their core function, staking service providers often complement their offering with a series of ancillary services intended to make participation easier, to reduce risks, or to render staking economically more attractive. One of the most common examples is *slashing coverage*, which consists of indemnification against losses that may arise when the protocol penalizes a validator through the partial or total forfeiture of staked assets. From a legal perspective, this mechanism resembles insurance and may, depending on the jurisdiction, fall within the scope of financial or insurance regulation.

Another frequent feature is *early unbonding*. While most protocols require staked assets to remain immobilized for a fixed period—the bonding period—some providers allow clients to withdraw their assets before the term expires. In practice, the provider assumes the cost of maintaining liquidity or pre-finances the withdrawal, thereby creating a facility that is economically similar to lending or liquidity transformation. For this reason, such services may also attract regulatory scrutiny.

Providers may also propose *alternative reward schedules*, departing from the protocol's native reward system. Rewards can be distributed at fixed intervals, subject to smoothing mechanisms, or even guaranteed at a minimum level. These arrangements, while convenient for users, alter the economic nature of staking and may lead regulators to treat them as interest-bearing products or investment services, with the consequent application of MiCA or national securities laws.

Finally, some providers offer *aggregation services*, whereby multiple holders can pool their assets in order to meet the minimum threshold required to operate a validator node. This lowers barriers to entry and facilitates broader participation in PoS networks. At the same time, however, it introduces legal complexities: pooling arrangements may resemble collective investment structures and, under certain conditions, fall within the regulatory perimeter governing investment schemes or analogous categories.

Taken together, these ancillary services illustrate how staking has evolved from a purely technical consensus mechanism into a complex ecosystem of layered offerings. Each such service modifies the risk allocation between user and provider, and therefore requires careful, case-by-case, legal qualification to determine whether it remains within the domain of unregulated activity or whether it crosses into the scope of regulated financial, insurance, or investment services.

Finally, for the sake of completeness, it is worth mentioning a further model known as *liquid staking*. Liquid staking constitutes an evolution of traditional staking arrangements, as it enables token holders to delegate their assets to validators while simultaneously receiving derivative tokens that remain transferable and tradable on secondary markets. This mechanism enhances market liquidity and capital efficiency, but at the same time raises complex regulatory challenges. On the one hand, it blurs the line between staking services and investment products, potentially triggering the application of securities law or collective investment scheme regulation whose application will be fostered by the "protocol" nature of the entity issuing the tokens. On the other hand, it entails additional risks, such as the volatility of derivative tokens, rehypothecation practices, and systemic concentration around a limited number of large liquid staking providers. The legal qualification of these arrangements therefore requires careful scrutiny, both under financial markets regulation and within the framework of consumer protection law.

4. *Risks taxonomy*

When constructing a taxonomy of the risks associated with staking activities, it is possible to distinguish, at a minimum, between two categories: (i) risks for the individual holder and (ii) risks for the ecosystem as a whole [13].

[13] According to FINMA, cit., another risk is the "*Market risk, as it may not be possible to sell staked cryptoassets at the right time in a volatile period if the unstaking process includes a lock-up/exit, creating a delay in returning blocked cryptoassets*". This risk, however, will not be further addressed here, since it cannot be effectively mitigated through regulation of staking

The first category concerns the relationship between the holder and the protocol (in the case of solo staking), or among the holder, the protocol, and the intermediary (in the case of delegated or custodial staking). Within this domain, the primary risk is the classic risk of intermediation: information asymmetry. In solo staking, asymmetry is less pronounced, since the "intermediary" is the protocol itself, and thus any asymmetry derives "just" from the complexity of the underlying code. Nevertheless, such technological asymmetry is not negligible, as most holders lack the expertise to fully scrutinize or audit the protocol's governance rules.

By contrast, in delegated or custodial staking, the asymmetry vis-à-vis the protocol is reduced by the expertise of the intermediary offering the service. Its involvement in the process can reduce the transaction costs associated with participating in validation activities—costs that would otherwise fall directly on the individual holder—thereby broadening and democratizing access to protocol rewards. On the other hand, the presence of an intermediary brings to the table moral hazard and so a counterparty risk.

This risk is particularly pronounced in custodial staking, where the holder relinquishes direct control over the staked crypto-assets. In such cases, the solvency, reliability, and integrity of the intermediary become decisive factors, and the holder is exposed to the risk of mismanagement or even misappropriation.

In solo staking, by contrast, counterparty risk coincides with the risk of technical failure: the only "counterparty" is the protocol, an automated system with no discretion, which reduces, but does not eliminate, risks.

Delegated staking occupies an intermediate position: although the holder retains control of his crypto-assets, reliance on a validator still entails exposure to operational or reputational risks stemming from the intermediary's software robustness.

Turning to risks for the ecosystem, it must be recalled that staking lies at the core of the crypto-asset market. The degree of concentration of validator nodes has systemic implications. If holders are disincentivized from solo staking, and only a limited number of intermediaries provide delegated or custodial services, there is a tangible risk of oligopolistic concentration. Such a scenario undermines decentralization and increases the vulnerability of the network to collusion or capture.

The risk of oligopoly is further amplified by contractual clauses in staking agreements, particularly those concerning governance rights—that is, who has the authority to make decisions regarding the staked crypto-assets. The greater

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services. Rather, the requirement that crypto-assets remain locked for a certain period should be regarded as a core structural feature of the staking mechanism itself.

the concentration of such governance powers in the hands of a small number of intermediaries, the greater the systemic fragility of the ecosystem as a whole.

5. *Legal and regulatory analysis*

In general terms, staking is primarily a technical process, and the provision of staking services may be conceptualized as the supply of a technological service.

Regulatory concerns, however, may arise where the offering of staking is coupled with additional features that alter its economic and legal profile. Three situations are particularly noteworthy. The first is when staking is marketed together with promises of returns unrelated to the rewards generated by validation activity. The second is when the service is structured in a manner that approximates fund management, for instance by pooling assets under discretionary control of the provider. In both cases, the providing of staking could acquire the economic characteristics of a regulated financial service. The third, already discussed above, is the case of custodial staking where a MiCAR license as custody service provider is required before offering the service to the public.

Solo staking and delegated (non-custodial) staking, are not regulated services. This is true both from a financial (i.e. under MiFID [14]) or "crypto" (i.e. under MiCAR [15]) point of view. This approach finds confirmation, first, in the structure of the MiCAR. Notably, MiCAR does not expressly mention staking among the regulated crypto-asset services. The only activity that could conceivably be connected (but it is not) to staking under MiCA's taxonomy is the transfer of crypto-assets, but this is ancillary and does not capture the essence of staking itself. The absence of a specific reference to staking suggests that the European legislator did not consider it, in its pure technical form, as falling within the perimeter of financial services regulation.

Indeed, the European regulator has expressed its clear opinion on staking service through ESMA Q&A no. 2067 of the 9th January 2024. To the specific question "*Does MiCA prohibit staking-related services or are staking activities exempt from the application of MiCA?*", the European Commission intervened, answering that "*MiCA does not contain provisions specific to staking. It does not therefore prohibit staking, and staking as such is not subject to specific requirements or licensing*". But the Authority also clarified that when the service

[14] Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU (recast) Text with EEA relevance.

[15] Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets.

is provided by an intermediary that controls the private keys of the user, then "*The provision of staking services therefore requires that the crypto asset staking service provider is authorised under MiCA to provide custody and administration of crypto-assets on behalf of clients*". In this respect, the Authority also clarify that in custodial staking, the risk of slashing or other loss of crypto-assets connected to the behaviour of the intermediaries, should be borne by the intermediaries themselves. This clear statement puts some doubt on the validity of clauses providing the contrary. An additional important clarification given by the Authority is that CASP offering custodial services, need the express consent of the users "*to stake their crypto-assets, as it may have an impact on their clients' ability to access them*" [16].

While the European regulator limited its intervention to a Q&A, US and Swiss authorities have issued two dedicated statements on this topic.

In particular, the U.S. Securities and Exchange Commission (SEC) issued a statement on 29 May 2025 clarifying that staking activities—whether in the form of solo, delegated, or custodial staking—do not constitute an offer or sale of securities under the Securities Exchange Act.

Applying the Howey Test, the SEC emphasized the absence of the criterion known as the "efforts of others". According to the authority, the activity of the node operator is characterized as an administrative or "*ministerial*" activity of the protocol. This is insufficient to satisfy the entrepreneurial or managerial effort required under Howey. In particular, the SEC stated that "*rewards are payments to the Node Operator in exchange for the services it provides to the network rather than profits derived from the entrepreneurial or managerial efforts of others*". This reasoning firmly distances staking rewards from the concept of "investment profits", anchoring them instead in the logic of technical service provision [17].

FINMA, the Swiss Financial Market Authority, issued an even less recent statement in December 2023. Here, FINMA focuses on the relationship between banking license and staking services. In particular, FINMA states that a banking license is required for staking services in two particular scenarios. The first one is when crypto-asset are held in a collective custody but are not "*held in readiness at all times*" for the customer [18]. The second hypothesis is when crypto-assets are held in collective custody without clear customer shares [19]. This raises

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[16] ESMA Q&A, No. 2067 of the 9th January 2024.

[17] Although the SEC has expressly taken a position with regard to staking, the principles articulated could in the future be extended to the provision of financial services by decentralised protocols.

[18] FINMA, cit., 6.

[19] FINMA, cit., 6.

the risk that staking, when combined with custody or collective arrangements, could approximate regulated financial services, especially where the intermediary exercises discretionary control over pooled assets.

6. *Future evolutions and future research*

The field of staking remains relatively nascent, and it can be reasonably anticipated that new practices—both technical and contractual—will continue to emerge as the market matures. The rapid pace of technological development in blockchain networks, combined with the commercial incentives of intermediaries, suggests that novel staking models, including variations of delegated or pooled staking, will proliferate. Each of these models may raise distinct legal and regulatory questions, particularly with regard to the allocation of risks and responsibilities among the parties involved.

Given that staking offers the prospect of relatively stable returns coupled with comparatively low risk, the sector may become increasingly attractive to institutional investors managing substantial pools of savings. Such investors typically operate under strict prudential and conduct requirements. Should institutional participation materialize on a significant scale, the legal qualification of staking arrangements will demand closer scrutiny, as supervisory authorities may be called upon to assess whether such activities fall within the perimeter of regulated investment services.

Future research could therefore focus on the precise nature of the relationship between intermediaries and users, exploring whether such relationship is to be construed in purely civil law terms (mandate, deposit, or service contract) or whether it assumes the features of an investment relationship subject to financial regulation. This line of inquiry is crucial, as the contractual qualification adopted may have far-reaching implications for liability, risk distribution, and the applicable supervisory regime.

Moreover, as staking services become more widely accessible to retail clients, consumer protection law is likely to emerge as a further field of inquiry. Issues such as the transparency and comprehensibility of contractual documentation, the disclosure of technological and market risks, and the enforceability of contractual terms in the event of slashing or network failure will acquire increasing significance. The asymmetry of information between professional staking service providers and retail clients underscores the importance of developing adequate safeguards.

In conclusion, staking epitomises the broader regulatory challenge posed by decentralised finance: how to adapt legal frameworks designed for traditional, person-based intermediaries to services that are technologically driven and

often lack a clearly identifiable operator. Addressing this challenge will require not only legal scholarship, but also interdisciplinary collaboration, so as to integrate perspectives from economics, computer science, and financial practice into a coherent regulatory approach.